Research Article

Study of Correlations Between Basic Chemical and Economic Indicators in Virginia Tobacco

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Abstract: We restudied interconnections between main economic and chemical parameters in Virginia tobacco.Were established a positive correlation between the content of nicotine and soluble sugars. Very strong positive correlation was observed between the content of nicotine and proteins. There is a significant negative correlation between the content of sugars and proteins. The vegetation period is positively correlated with the percentage of all studied chemical indicators, particularly pronounced with that of nicotine. The magnitude in yield is a significant negative correlation with percentage of nicotine and proteins. The depending parameters and correlations can practically to apply in the selection activity.
Keywords: Virginiatobacco, correlation,depending parameters, chemical and economic performance.

INTRODUCTION

The main elements of the chemical composition of Virginia tobacco is nicotine, sugars (soluble carbohydrates), total nitrogen and proteins [3, 4, 9]. Their ratio largely determines the profile type and the overall performance of Virginia tobacco. Information on research on interdependencies between basic chemical and economical performance is inadequate [1, 5, 6, 7, 8, 10, 11, 12]. It has been shown that the productivity and reducing sugars are closely related. The correlation between them is positive and significant. Productivity addiction - nicotine is negative and significant. The progressive increase of the productive capacity of the genotype is related to the negative effects and expression of nicotine. When decreasing the level of reducing carbohydrates, the regression curve (nicotine - sugars) is monotonically a growing. The correlation between them is negative and significant [2].

The aim of our research is the disclosure of correlation relationships between key economic indicators and chemical in tobacco by variety group Virginia, focusing relevance in the selection activity.

MATERIALS AND METHODS

Experience is carry out to base block method for the period 2010-2012 year. Object of study were 10 varieties and lines - Virginia 514, Virginia C326, Coker254, Coker 347, Spaitg 28, Virginia 330, Virginia 250, Cocer 394, Line 842, Line 607. The cultivation, harvesting and drying of tobacco is according to adopted for this varietal technology.

Are certain dependencies between indicators: production of dry tobacco per hectare, percentage of first class, length of vegetation period, the percentage of nicotine, sugars (soluble carbohydrates), total nitrogen and protein.The correlation analysis of the data was performed using the statistical package SPSS. To measure the strength of the connection between the studied indicators used linear correlation coefficient.

RESULTS AND DISCUSSION

There is a positive correlation between the content of nicotine and soluble sugars. Increasing the percentage of nicotine is related to increased rates of sugars. Less expressed dependence between the content of nicotine and total nitrogen. Very strong positive correlation was observed between the content of nicotine and proteins. Such anchoring is a the highest values of all correlation established in the study – figure1.

There is a in significant positive correlation between the contents of sugars and total nitrogen. There is a significant negative correlation between the content of sugars and proteins – figure2.

Between the content of total nitrogen and protein no relationship with significant values – figure3.

The vegetation period is positively correlated with the percentage of all studied chemical indicators.

With the larger value it exhibited at the content of nicotine. On this basis it can be argued that under Virginia tobacco higher percentage of nicotine is closely correlated to the greater length of the the vegetation period – figure4.

The magnitude in yield is markedly negative correlation with the content of nicotine and proteins. Yield not influences significantly on the percentage of sugars and total nitrogen – figure5.

The correlation between the percentage of first class and studied chemical indicators is insignificant-figure 6.

As a result of the study can be concluded that there is a positive correlation between the content of nicotine and soluble sugars. Very strong positive correlation was observed between the content of nicotine and proteins. There is a significant negative correlation between the content of sugars and proteins. The vegetation period is positively correlated with the percentage of all studied chemical indicators, particularly pronounced with that of nicotine. The magnitude of the yield is a significant negative correlation with percentage of nicotine and proteins.
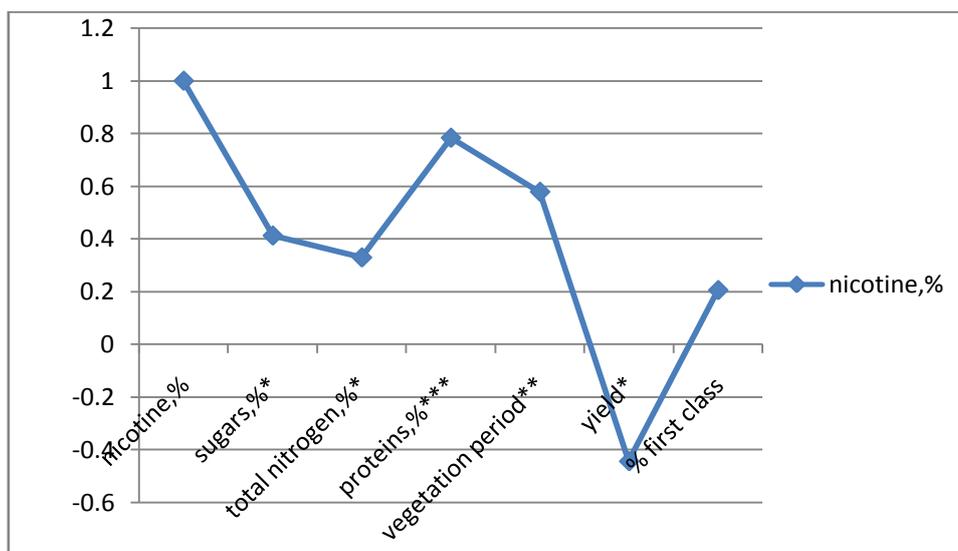

Fig-1: Correlation between the content of nicotine and and studied chemical indicators
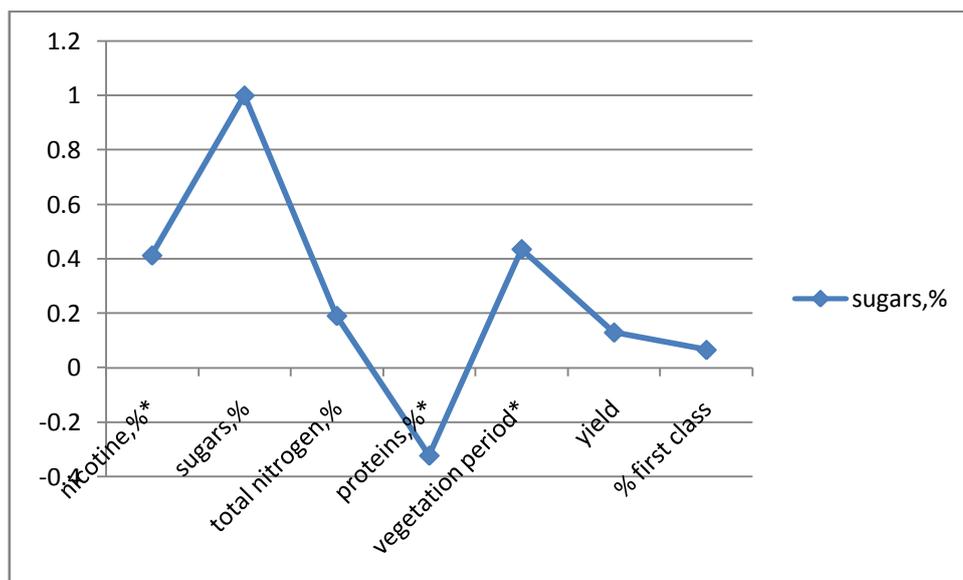***p≤0.05; ** p≤0.01;   *** p≤0.001**

Fig-2: Correlation between the contents of sugars and and studied chemical indicators
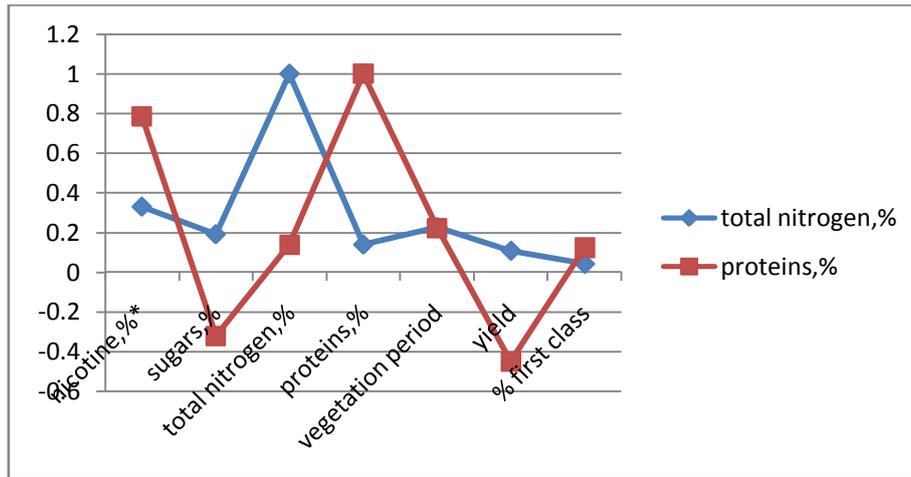***p≤0.05; ** p≤0.01;   *** p≤0.001**

Fig-3: Correlation between the content of total nitrogen and protein, and studiedc hemical indicators
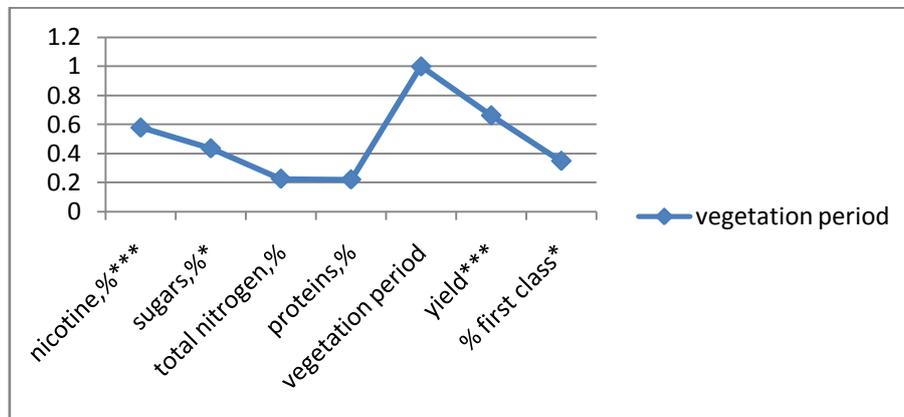*p≤0.05; ** p≤0.01;   *** p≤0.001

Fig-4: Correlation between the vegetation period and all studied chemical indicators
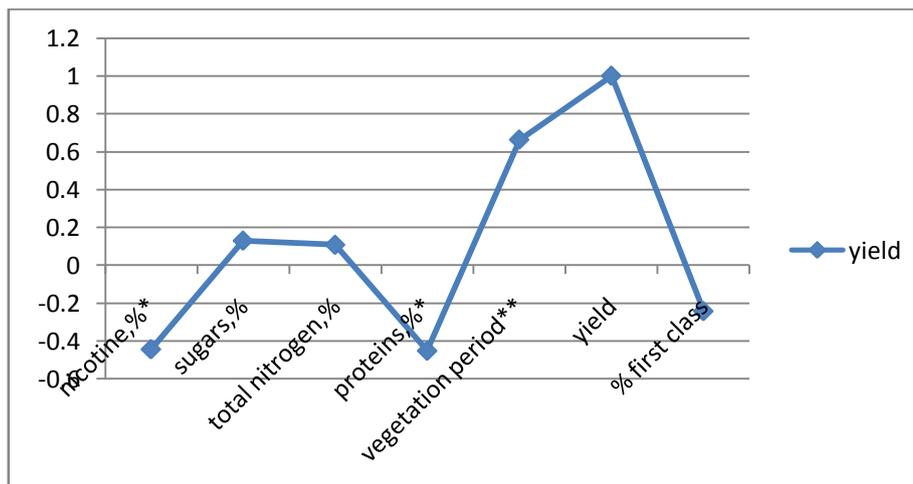*p≤0.05; ** p≤0.01;   *** p≤0.001

Fig-5: Correlation between yield and and studied chemical indicators
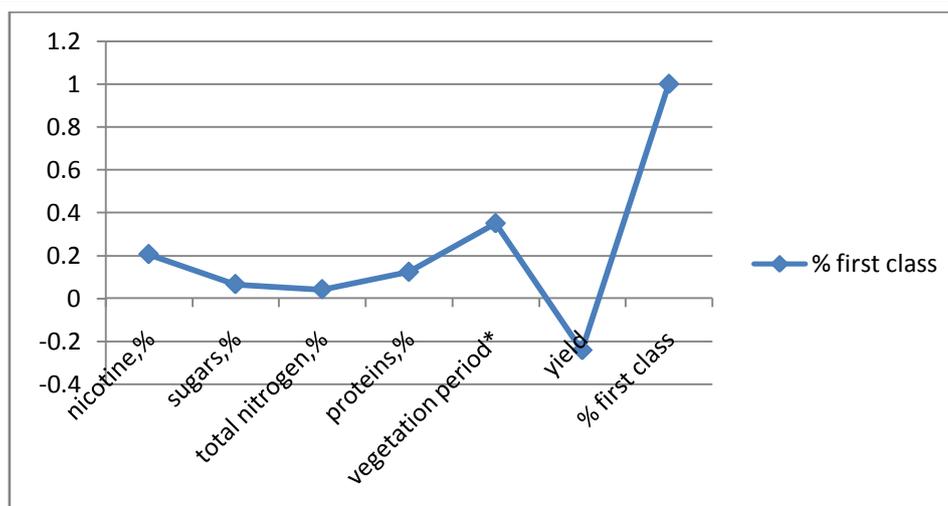*p≤0.05; ** p≤0.01;   *** p≤0.001

Fig-6: Correlation between the percentage of first class and studied chemical indicators
*p≤0.05; ** p≤0.01;   *** p≤0.001

CONCLUSION

The depending parameters can practically to apply in the selection activity, the main highlights are: increasing nicotine proportionally with the increase of sugar higher nicotine content, however, is closely related to the length of the the vegetation period and last but not least, the established negative correlation between the yield and content of nicotine and proteins.

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